AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A method for the prediction and optimization of a communications system comprising:

inputting data from a plurality of channels into a prediction module of the communications system;

predicting a performance of at least one of the plurality of channels using a plurality of parameters to characterize the performance of the at least one of the plurality of channels;

creating at least one transfer function model of the at least one of the plurality of channels, wherein the at least one transfer function model is simulated using physical configuration information of the communications system; and

optimizing the parameters of at least one of the plurality of channels in order to improve a bit rate of the at least one of the plurality of channels in the communications system.

2. (Previously Presented) The method claim 1 wherein predicting the performance of the at least one of the plurality of channels comprises:

inputting data from at least one channel of the communications system into a prediction module;

determining an impairment on the at least one channel;

characterizing the at least one channel using the at least one transfer function model and the impairment.

3. (Canceled)

4. (Previously Presented) The method of claim 2 wherein the at least one transfer function model is simulated using a spectrum management system.

5. (Canceled)

6. (Previously Presented) The method of claim 2 wherein the impairment is selected from the group consisting of: a cross-talk impairment, an AM radio interference, a temperature impairment, and any combination thereof.

7. (Previously Presented) The method of claim 1 wherein optimizing the parameters comprises:

a) choosing a first parameter for the at least one of the plurality of channels;

b) choosing a second parameter for the at least one of the plurality of channels;

c) determining an optimization criteria for the channel based upon the first parameter and the second parameter;

d) repeating a) - c) until the optimization criteria is optimized for the communications system.

8. (Previously Presented) The method of claim 1 wherein the communications system is a wireline communications system.

9. (Previously Presented) The method of claim 1 wherein the communications system is a wireless communications system.

10. (Previously Presented) The method of claim 1 wherein the communications system is an optical communications system.

11. (Previously Presented) The method of claim 1 wherein the communications system is a cable communications system.

12. (Previously Presented) The method of claim 1 wherein the communications system is a DSL communications system.

13. (Previously Presented) A system for the prediction and optimization of a communications system comprising:

a prediction module, wherein the prediction module predicts the performance of at least one channel in the communications system by providing a characterization of at least one parameter that describes the at least one channel; and wherein the prediction module creates at least one transfer function model of the at least one channel such that the at least one transfer function model is simulated using physical configuration information of the communications system; and

an optimization module, wherein the optimization module finds the optimum characterization for the at least one channel based on at least one design criteria.

14. (Previously Presented) The system of claim 13 wherein the design criteria are selected from the group consisting of: a cost of deployment, a signal to noise ratio, a total revenue, a bit rate, and any combination thereof.

15. (Previously Presented) The system of claim 13 wherein the communications system is a wireline communications system.

16. (Previously Presented) The system of claim 13 wherein the communications system is a wireless communications system.

17. (Previously Presented) The system of claim 13 wherein the communications system is an optical communications system.

18. (Previously Presented) The system of claim 13 wherein the communications system is a cable communications system.

19. (Previously Presented) The system of claim 13 wherein the communications system is a DSL communications system.

20. (Previously Presented) A method for the prediction of the performance of a communications system comprising:

inputting data from at least one channel of the communications system into a prediction module;

creating at least one transfer function model of the at least one channel, wherein the at least one transfer function model is simulated using physical configuration information of communications system;

determining an impairment on the at least one channel;

characterizing the at least one channel using said at least one transfer function model and said impairment.

21. (Canceled)

22. (Previously Presented) The method of claim 20 wherein the at least one transfer function model is simulated using a spectrum management system.

23. (Canceled)

24. (Previously Presented) The method of claim 20 wherein the impairment is selected from the group consisting of: a cross-talk impairment, an AM radio interference, a temperature impairment, and any combination thereof.

25. (Previously Presented) The method of claim 20 wherein the communications system is a wireline communications system.

26. (Previously Presented) The method of claim 20 wherein the communications system is a wireless communications system.

27. (Previously Presented) The method of claim 20 wherein the communications system is an optical communications system.

28. (Previously Presented) The method of claim 20 wherein the communications system is a cable communications system.

29. (Previously Presented) The method of claim 20 wherein the communications system is a DSL communications system.

30. (Previously Presented) A method for the prediction and optimization of a communications system comprising:

inputting data from at least one channel into a prediction module of the communications system;

creating at least one transfer function model of the at least one channel, wherein the at least one transfer function model is simulated using physical configuration information of the communication system;

predicting a performance of the at least one channel using at least one parameter to characterize the performance of the at least one channel; and

optimizing the at least one parameter of at least one channel in order to improve a bit rate of the at least one of the channels in the communications system.

31. (Previously Presented) The method claim 30 wherein predicting the performance of the at least one of the channels comprises:

inputting data from at least one channel of the communications system into a prediction module;

determining an impairment on the at least one channel;

characterizing the at least one channel using the at least one transfer function model and the impairment.

32. (Canceled)

33. (Previously Presented) The method of claim 31 wherein the at least one transfer function model is simulated using a spectrum management system.

34. (Canceled)

35. (Previously Presented) The method of claim 31 wherein the impairment is selected from the group consisting of: a cross-talk impairment, an AM radio interference, a temperature impairment, and any combination thereof.

36. (Previously Presented) The method of claim 30 wherein optimizing the at least one parameter comprises:

a) choosing a first parameter for the at least one channel;

b) choosing a second parameter for the at least one channel;

c) determining an optimization criteria for the at least one channel based upon the first parameter and the second parameter;

d) repeating a) - c) until the optimization criteria is optimized for the communications system.

37. (Previously Presented) The method of claim 30 wherein the communications system is a wireline communications system.

38. (Previously Presented) The method of claim 30 wherein the communications system is a wireless communications system.

39. (Previously Presented) The method of claim 30 wherein the communications system is an optical communications system.

40. (Previously Presented) The method of claim 30 wherein the communications system is a cable communications system.

41. (Previously Presented) The method of claim 30 wherein the communications system is a DSL communications system.

42. (Currently Amended)   The method of claim 1, wherein optimizing the parameters of at least one of the plurality of channels comprises:

subjecting the ~~optimizer~~ optimization of the parameters to-at least ~~once~~ one constraint selected from the group consisting of: transfer functions and uncertainties, pricing as a function of service level, service type, spectral management rules, residential customers, home office customers, small business customers, general business customers, and combinations thereof.

43. (Currently Amended)   The ~~method~~ system of claim 13, wherein ~~optimizing the parameters of at least one of the plurality of channels comprises:~~

~~subjecting the optimizer to at least once constraint~~ the at least one design criteria is selected from the group consisting of: transfer functions and uncertainties, pricing as a function of service level, service type, spectral management rules, residential customers, home office customers, small business customers, general business customers, and combinations thereof.

44. (Currently Amended)   The method of claim 30, wherein optimizing the at least one parameter[[s]] of at least one of the plurality of channels comprises:

subjecting the ~~optimizer~~ optimization of the parameters to at least ~~once~~ one constraint selected from the group consisting of: transfer functions and uncertainties, pricing as a function of service level, service type, spectral management rules, residential customers, home office customers, small business customers, general business customers, and combinations thereof.

optimizing the at least one parameter of at least one channel